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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,945	08/21/2001	Douglas Hamilton Taylor	9-15417-SUS	5238
20988	7590	08/19/2005	EXAMINER	
OGILVY RENAULT LLP 1981 MCGILL COLLEGE AVENUE SUITE 1600 MONTREAL, QC H3A2Y3 CANADA			MEEK, JACOB M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/932,945

Applicant(s)

TAYLOR ET AL.

Examiner

Jacob Meek

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 June 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 - 15 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed June 3, 2005 have been fully considered but they are not persuasive with regard to claims 1 and 7.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., FEC) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections. Examiner notes that many examples of DMT / OFDM systems utilize FEC, which is construed as leveraging FEC. A clear example or definition of "leveraging FEC" would be advantageous so that it can be discriminated from FEC as known in prior art.

It is further noted that the sorting of sub-carriers in order of their SNR is widely taught in the art along with the ability to support various modulation configurations.

2. Applicant's arguments with respect to claims 9 and 11 have been considered but are moot in view of the new ground(s) of rejection.

3. Restatement of previous rejections of claims 1, 2, 4, 7, and 8.

Claims 1, 2, 4, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes et al (US Patent 6,072,779) in view of Hansen (US Patent 6,807,234).

With regard to claim 1, Tzannes teaches a method of determining a number of sub-carriers having a signal-to-noise ratio above a predefined threshold (See column 3, lines 11 – 27 and column 6, lines 40 – 47); computing a number of useful sub-carriers by dividing by a predefined ratio (see column 4, lines 1 – 8, where the result of this calculation would result in a mapping of useful sub-carriers); and, computing a throughput by multiplying channels by a predefined capacity per sub-carrier (see column 3, lines 28 – 53. Tzannes is silent with respect to modulation configurations and the construction of the modulation configurations. Hansen teaches a method for providing modulation configurations of varying data types (see Figure 1); and constructing a sub-set of sub-carriers by selecting sub-carriers having the highest signal-to-noise ratio (see column 3, line 57 – column 4, line 4 where this is interpreted as equivalent functionality). It would have been obvious to one of ordinary skill at the time of invention to combine Tzannes' channel mapping / characterization techniques with Hansen's multi-service support platform to provide a communication device that would support a variety of services in manner that would allow optimization of bandwidth utilization.

With regard to claim 2, Tzannes teaches the method which calculates total capacity of the system bounded by the total number of available channels (see column 3, lines 28 – 53), and this is interpreted as providing the limitation of ensuring that number of carriers does not exceed total number of carriers.

With regard to claim 4, Tzannes teaches the method which stores the margin in the form of a look-up table (see column 2, lines 41 – 53) where this margin calculation is interpreted as provided equivalent functionality and is interpreted to be the result of empirical data.

With regard to claim 7, the functions claimed as the apparatus incorporate the method of claim 1 therefore it would have been obvious considering the aforementioned rejection of method claim 1. Tzannes and Hansen also disclose a method and an apparatus.

With regard to claim 8, the functions claimed as the apparatus incorporate the method of claim 2 therefore it would have been obvious considering the aforementioned rejection of method claim 2.

Tzannes and Hansen also disclose a method and apparatus.

### ***Claim Objections***

4. Claims 1, 2, 7 and 9 are objected to because of the following informalities:

Claims 1, 7, and 9 recite "signal-to-noise ration" and / or "predefined ration". Appropriate correction is required.

Claim 2 states "that the claim number of ... ". Examiner is unclear as to intent here.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes (US-6,775,320) in view of van Nee (US-6,175,550).

With regard to claim 1, Tzannes discloses a method for selecting a modulation configuration in a multi-carrier modulation system that supports a plurality of modulation configurations (see column 2, lines 49 – 65 where this is interpreted as equivalent), comprising step of: for each modulation configuration (see Table 4, and column 11, lines 41 – 59), determining a number of sub-carriers having a signal to noise ratio above a predefined threshold (table 4, Measured SNR column and column 12, lines 31 - 44); computing a

number of useful sub-carriers by processing sub-carriers (see column 11, lines 12 – 39 and Table 4, columns 3 and 4 where this is interpreted as computing usable sub-carriers); constructing a sub-set of sub-carriers by selecting sub-carriers having higher SNR (see Table 4, columns 5 & 6 and Table 5, column 4 & 5 where data preferentially utilizes higher SNR channels), and computing a throughput by multiplying useful sub-carriers by capacity per sub-carrier (see column 12, lines 31 – 55 and Tables 4 and 5, Totals); and selecting a modulation configuration having the highest throughput (see column 12, lines 41 – 63 where this is interpreted as equivalent). Tzannes is silent with respect to a predefined ratio. Van Nee discloses a method whereby a predetermined ratio of sub-carriers are used in order to improve system performance (see column 1, line 65 – line 2, line 2). It would have been obvious to one of ordinary skill in the art to incorporate van Nee's disclosure in Tzannes to result in a system that improves the operating capabilities of an OFDM system (see column 1, lines 38 – 56).

With regard to claim 5, Tzannes is silent with respect to predefined ratio selected using empirical results. Van Nee discloses means for adjusting parameters according to operating conditions (see column 4, lines 22 – 38). It would have been obvious to one of ordinary skill in the art to utilize van Nee's technique to produce a system of increased flexibility (see column 3, lines 28 – 34).

With regard to claim 6, Tzannes discloses that different FEC schemes are utilized for different services (see column 6, lines 19 – 36 where this is interpreted as leveraging FEC for modulation configurations).

6. Claims 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes et al (US Patent 6,072,779) in view of van Nee ('550).

With regard to claim 9, Tzannes teaches a method of selecting a 1<sup>st</sup> set of sub-carriers having a signal-to-noise ratio above a predefined threshold (See column 3, lines 11 – 27 and column 6, lines 40 – 47); processing first set of sub-carriers with a predetermined ratio to derive a number of sub-carriers to include in a 2<sup>nd</sup> larger group of sub-carriers (see column 3, lines 28 – 52); selecting the second subset of sub-carriers by selecting sub-carriers having a higher SNR (see column 7, line 49 – column 8, line 8). Tzannes is silent with respect to leveraging FEC used in modulation system to improve data throughput. Van Nee discloses a method of varying coding rate (see column 3, lines 39 – 43 where coding rate is interpreted as leveraging FEC). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize a variable coding scheme to improve system performance in dynamic conditions.

With regard to claim 10, Tzannes discloses a multi-carrier modulation system that supports a plurality of modulation configurations (see column 4, where bit allocations are interpreted as dictating modulation configurations) comprises the steps of: performing the steps of selecting the 1<sup>st</sup> sub-set (see column 3, lines 11 – 53), processing and selecting second subset for each modulation configuration (see column 3, line 54 – 67); computing a throughput for each modulation configuration (see figure 6 & 7); and using the modulation configuration having the highest throughput (see column 8, lines 39 – 48).

7. Claims 11, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzannes et al (US Patent 6,072,779) in view of van Nee ('550) in further view of Tzannes (US-6,498,808).

With regard to claim 11, Tzannes teaches a device comprising: a sub-carrier selector adapted to receive SNR for each of a plurality of sub-carriers (See column 3, lines 11 – 27);

to select a 1<sup>st</sup> set of sub-carriers (see column 6, lines 40 – 47); process 1st set of sub-carriers with a predetermined ratio to derive a number of sub-carriers to include in a 2<sup>nd</sup> larger group of sub-carriers for use by device (see column 3, lines 28 – 52); Tzannes ('779) is silent with respect to leveraging FEC used in modulation system to improve data throughput. Van Nee discloses a method of varying coding rate (see column 3., lines 39 – 43 where coding rate is interpreted as FEC). It would have been obvious to one of ordinary skill in the art at the time of invention to utilize a variable coding scheme to improve system performance in dynamic conditions. Tzannes ('779) is silent with respect to PNI applications. Tzannes ('808) discloses a rate adaptive DMT/OFDM system usable for PNI applications (see column 1, lines 38 – 50). It would have been obvious to one of ordinary skill in the art at the time of invention that DMT/OFDM systems could be adapted to PNI applications.

With regard to claim 12, Tzannes ('779) discloses a device where sub-carrier selector is further adapted to derive 2<sup>nd</sup>, larger sub-set of sub-carriers for each of a plurality of modulation configurations to transfer data. (see column 4, lines 1 – 8 where bit allocations are interpreted as dictating modulation configurations). Tzannes ('779) is silent with respect to PNI applications. Tzannes ('808) discloses a rate adaptive DMT/OFDM system usable for PNI applications (see column 1, lines 38 – 50). It would have been obvious to one of ordinary skill in the art at the time of invention that DMT/OFDM systems could be adapted to PNI applications.

With regard to claim 13, Tzannes ('779) discloses a device wherein sub-carrier map selector is adapted to compute a throughput for each modulation configuration (see figure 6 & 7). Tzannes ('779) is silent with respect to PNI applications. Tzannes ('808) discloses a rate adaptive DMT/OFDM system usable for PNI applications (see column 1, lines 38 – 50). It



would have been obvious to one of ordinary skill in the art at the time of invention that DMT/OFDM systems could be adapted to PNI applications.

With regard to claim 14, Tzannes ('779) discloses a device wherein sub-carrier map selector is adapted select one of the modulation configurations having the highest throughput (see column 8, lines 39 – 48). Tzannes ('779) is silent with respect to PNI applications. Tzannes ('808) discloses a rate adaptive DMT/OFDM system usable for PNI applications (see column 1, lines 38 – 50). It would have been obvious to one of ordinary skill in the art at the time of invention that DMT/OFDM systems could be adapted to PNI applications.

With regard to claim 15, Tzannes ('779) is silent with respect to home power line network. Tzannes ('808) discloses a rate adaptive DMT/OFDM system usable for PNI applications (see column 1, lines 38 – 50). It would have been obvious to one of ordinary skill in the art at the time of invention that DMT/OFDM systems could be adapted to PNI applications including home power line networks.

### ***Allowable Subject Matter***

8. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Other Cited Prior Art***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Grube et al (US-5,608,725) discloses a method and apparatus using tables sorted by capabilities. Klein (US-6,804,211); Sayeed (US-6,456,653); Wu

(US-6,134,273); and Van Kerckhove (US-5,812,599) all disclose rate adaptive DMT schemes. NPL references show variations of DMT based power line technologies.

### ***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

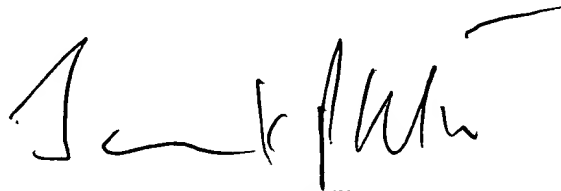
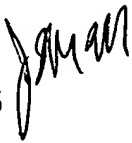
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM  
8/17/05



JAY K. PATEL  
SUPERVISORY PATENT EXAMINER